U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Ambrysus funebris*

COMMON NAME: Nevares Spring naucorid bug

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
_X_ Non-petitioned
___ Petitioned - Date petition received:
__ 90-day positive - FR date:
__ 12-month warranted but precluded - FR date:
__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)?
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions?
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

___ Listing priority change:
Former LP: __
New LP: __

Date when the species first became a Candidate (as currently defined): May 4, 2004.

___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Class Insecta, family Naucoridae (true water bug).

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California, USA.

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: California, Inyo County, USA.

LAND OWNERSHIP: All occurrences of the Nevares Spring naucorid bug are on Federal lands within Death Valley National Park.

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BIOLOGICAL INFORMATION

Species Description: The Nevares Spring naucorid bug, *Ambrysus funebris*, is a flightless, aquatic insect that is approximately one quarter of an inch long.

Photo Credit: Robert W. Sites, University of Missouri and Noah K. Whiteman, PhD, Harvard University, 2008.

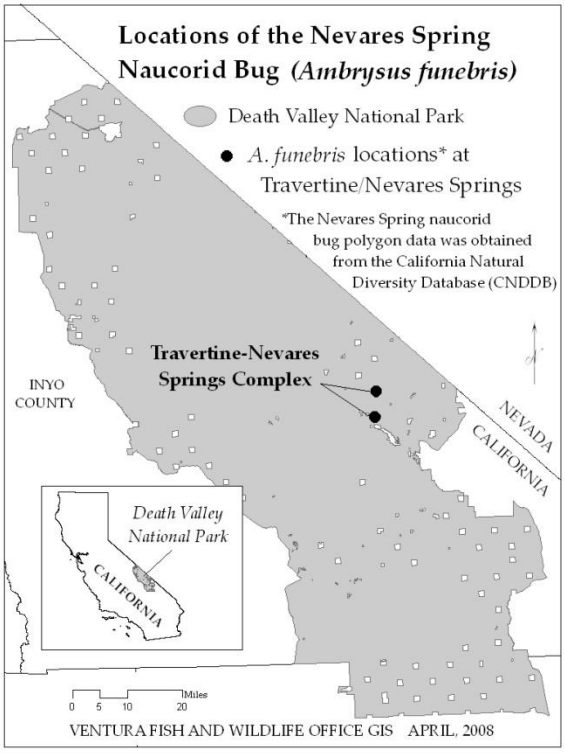
Taxonomy: The Nevares Spring naucorid bug was described using specimens that were collected from Nevares Spring in Inyo County, California (La Rivers 1948, p. 107). *Ambrysus funebris* is recognized as being a valid and current taxonomic entity according to the Integrated

Taxonomic Information System. The Nevares Spring naucorid bug is one of three naucorid species that are endemic to the Amargosa River drainage along the Nevada-California border.

Habitat/Life History: Naucorids typically prefer stream riffles that are swift enough to keep sand and silt from accumulating, but not so fast that coarse, gravelly substrates are removed (La Rivers 1948, p. 107). Laboratory and *in situ* field studies of different naucorid species have confirmed that naucorid habitat preferences are not random, and that water velocity and substrate size play a significant role in determining animal presence or absence (Sites and Willig 1991, p. 132; Herrmann et al.1993, p. 571). These studies also suggest that naucorids have ecological or physiological constraints that limit their ability to persist in modified stream habitats. Water pumping or diversion activities that modify water velocities or substrate characteristics are therefore likely to affect the distribution and abundance of naucorids because they have a finite ability to use altered streams.

Historical and Current Range/Distribution: The Nevares Spring naucorid bug is limited to the Travertine-Nevares Springs Complex (Complex) within the boundary of Death Valley National Park (Park). The Travertine Springs area is 2 miles long and 1 mile wide; it includes approximately 20 springbrooks and is located 1.5-2.5 miles east of the Furnace Creek Inn and Ranch resort (Ranch) and the Park headquarters building. Texas Spring is an especially notable spring at the northwestern edge of the Travertine Springs area because it possesses a high-volume discharge. The Nevares Spring area is 0.7 mile long and 0.3 mile wide; it is located 5 miles north of the Travertine Springs area in an area locally referred to as Cow Creek and possesses 14 springbrooks.

The current distribution of the Nevares Spring naucorid bug continues to be limited to the Complex, but the area the species now occupies is substantially smaller than what existed historically. Several of the aquatic habitats where the insect occurred have been eliminated or substantially reduced in size. Eight additional aquatic invertebrate species, including one snail, a springsnail, at least two amphipods, three ostracodes, and one riffle beetle also have distributions that are endemic to the Travertine-Nevares Springs Complex (Whiteman and Sites 2008, p. 501). The Nevares Spring naucorid bug is the rarest and the only species from the Complex listed as a candidate for protection under the Endangered Species Act.



Population Estimates/Status: The Nevares Spring naucorid bug occurs in the Travertine-Nevares Springs Complex where several water collection systems have been installed to provide water for commercial and domestic uses within Death Valley National Park. These water collection systems have caused the elimination of, or alteration to, several aquatic and wetland habitats in the Furnace Creek and Cow Creek areas. Data on the abundance and distribution of the Nevares Spring naucorid bug prior to the development of the water collection systems and elimination/alteration of these aquatic habitats are not available. Historically, the species likely occupied a substantial portion of the aquatic habitat that was present in the Complex where suitable micro-habitat features were present. The widespread loss of aquatic habitat within the Complex since the water collection systems were installed suggests the species has experienced major reductions in abundance and distribution as stream environments were eliminated or reduced in extent. The area of occupied habitat, if combined, is approximately a single acre.

Threloff (2001, p. 13), Sada and Herbst (2006, p. 42) determined the distribution and abundance of the Nevares Spring naucorid bug in the Complex through intensive surveys. These surveys documented the presence of the species in 8 of the 20 stream habitats in the Travertine Springs area (Table 1). The species' presence at Texas Spring represents an introduced population. These same surveys documented the presence of the naucorid bug in 4 of the 14 stream habitats in the Nevares Spring area. One of the surveys demonstrated that the Nevares Spring naucorid bug occurs at low densities (Sada and Herbst 2006, p. 42). In May of 1999, the total number of aquatic invertebrates at 72 locations in the Travertine Springs area was sampled by using 4 by 4.7 inch quadrats. The results showed the presence of 42,777 individuals belonging to 59 species; only 36 of these 42,777 individuals were *Ambrysus funebris.* Work during this same period in the Nevares Spring area documented the presence of 7,821 individuals belonging to 55 species in 31 quadrats; only 10 of these 7,821 individuals were *A. funebris.* These data suggest

that the species is extremely rare within its limited distribution. Whiteman and Sites (2008, p. 501) have identified the five nymphal instars of the species and the thermal environments in which they are found.

Table 1. Length of stream habitats occupied by The Nevares Spring naucorid bug (*Ambrysus funebris*) in the Travertine-Nevares Springs Complex, Death Valley National Park, California.

stream number	stream length (feet)	affected by past or ongoing water diversion activities?
Travertine Spring stream #1	137	Yes
Travertine Spring stream #2	429	No
Travertine Spring stream #3	643	Yes
Travertine Spring stream #4	912	Yes
Travertine Spring stream #5	967	Yes
Travertine Spring stream #6	2,063	Yes
Travertine Spring stream #7	2,270	Yes
Travertine Spring stream #8	2,500	Yes
Nevares Spring stream #1	187	Yes
Nevares Spring stream #2	416	Yes
Nevares Spring stream #3	417	No
Nevares Spring stream #4	790	No

THREATS

A. <u>The present or threatened destruction, modification, or curtailment of its habitat or range</u>: The primary threat pertaining to the Nevares Spring naucorid bug is water diversion that adversely affects the amount and quality of the insect's aquatic habitat. Water collection facilities have been installed at eight locations within the Travertine-Nevares Springs Complex. Seven of these facilities provide water that meets human use needs in the Furnace Creek area, and one facility provides potable and irrigation water to the Cow Creek area.

The water users in the Furnace Creek area include the National Park Service, the Timbisha Shoshone Indian tribe, and the Furnace Creek Inn and Ranch resort. Between 1987 and 2000, the Ranch consumed 92 percent of the water that was collected from the springs in the Furnace Creek area, and the National Park Service and Timbisha Shoshone Indian Tribe consumed the remainder of the water that was collected. The average combined monthly potable and non-potable water consumption for the three water users during this period was 52,440,000 gallons per month (Psomas 2001, p. 9-12). In 2000, the Timbisha Shoshone Indian tribe was granted reservation status and received a water right of approximately 29 million gallons of water per year. If the other two water users in the Furnace Creek area

continue to collect water at previous levels, this new water right will create an additional burden to collect a volume of water that has not, for the most part, previously been diverted from the local springs.

Water collection in the Furnace Creek area is governed by a 1968 Memorandum of Understanding (MOU) that was signed by the United States of America, Borax (Holdings) Limited, and Fred Harvey, Inc. (i.e., the Furnace Creek Inn and Ranch). Under this MOU, the National Park Service has the discretion to deliver water in excess of the Ranch's basic water right of 486 million gallons per year. The National Park Service has exercised this discretionary option in the past and, between 1990 and 1994, administrative records indicate that an average of 143 million gallons of water per year was delivered to the Ranch above its legal entitlement. Most of this water was used to irrigate a golf course and provide water to two flow-through swimming pools during the summer months. During the warmer months following May of each year, the total monthly water consumption by the Ranch can increase by 7,380,000 gallons as compared to the months of December and January.

The Ranch has questioned the validity of historical records that have been used to document the amount of water that was delivered to their property; it remains clear, however, that water deliveries to the Ranch have tended to increase dramatically during the summer months as compared to other months of the year when air temperatures are cooler. Death Valley National Park is installing new, more sensitive flow meters at several locations in the Furnace Creek Ranch area in an effort to better quantify the amount of water that is being delivered to the Ranch.

Approximately 83 million gallons of water per year are collected from the Nevares Spring water gallery in the Cow Creek area. This water is for a National Park Service employee housing and office area.

The majority of the water collection systems that have been installed in the Travertine Springs and Nevares Spring use perforated pipe galleries that were installed after the original spring sources were excavated. The National Park Service has no data on the extent of streams in the Complex prior to the development of the water collection systems. During the summer of 1999, water was diverted from the Travertine Springs water collection system to the surface environment because harmful bacteria were present in the potable water supply. The need to temporarily turn on and off various portions of the Travertine Springs water collection system allowed spring water to be released to the surface environment; this created an unprecedented opportunity to assess the effects of water diversion activities. A Global Positioning System (GPS) was used to map the extent of surface water with and without water being diverted to the Furnace Creek domestic water supply. The results of the GPS mapping indicate that water diversion activities in the Furnace Creek area are collectively responsible for the loss of 36,500 feet of stream habitat when the system is fully operational (Threloff 2001, p. 3). This work demonstrated that operation of the Travertine Springs water collection facilities are collectively responsible for eliminating 80 to 85 percent of the aquatic habitat that could potentially occur in that area. Approximately 80 percent of the streams in the Travertine Springs area that persist when the water collection system is operational have attributes of human disturbance (i.e., current or abandoned water diversion structures or

evidence of ground disturbance) that suggest that they have been, or are adversely affected by, historical or ongoing water diversion activities.

The original spring outflow and biological community for Texas Spring were completely eliminated when the current water collection system was developed and the entire spring discharge was diverted into the Furnace Creek potable water collection system (Threloff 2001, p. 24). This action eliminated a stream habitat that probably was at least 4 miles in length prior to its diversion. A small stream habitat 100 feet west of the historical Texas Spring orifice was partially restored in the mid-1990s when Park maintenance staff diverted a portion of the spring discharge to the local surface environment; however, because the Nevares Spring naucorid bug is flightless, it is unlikely the bug re-colonized the stream.

Sada and Herbst (2006, pp. 45-48) conducted an in-depth study of the effects of water diversion activities on the Travertine-Nevares Springs Complex invertebrate community. Sada and Herbst found that the presence and abundance of different aquatic invertebrate species in the Complex were affected by factors such as water velocity and depth, amount of plant cover providing diversity of light, and the size and presence of different substrates. Each of these factors is influenced by the intensity of water diversion. As water is diverted from a stream, water velocity and depth, and wetted perimeter width are reduced, which affects adjacent plant communities and the preponderance of silts and gravels along the stream bottom. The study also found trends that suggest that decreased water flow in a stream channel causes changes in the:

1. Presence or absence of endemic species, including the Nevares Spring naucorid bug;
2. Total number of aquatic invertebrate species present at a given location;
3. Relative abundance of aquatic species in the invertebrate community; and
4. Abundance of individual endemic and non-endemic aquatic invertebrate species, including the Nevares Spring naucorid bug.

The cumulative effect of removing 40-52 million gallons of water each month from the Travertine Springs area has likely adversely affected the Nevares Spring naucorid bug such that the remaining populations of the species are relatively small, isolated, and vulnerable to extirpation. The effects of these water diversion activities are most pronounced during the summer months when more water is diverted to flowthrough swimming pools and a golf course; these water diversions coincide with a period of high evapo-transpiration which causes the aquatic habitats that are occupied by the species to be most restricted and vulnerable to perturbation.

In 2008, the Park constructed a groundwater pumping collection gallery. This new system proposed to include a strategy for restoring some aquatic habitat in the Furnace Creek area, but also included a proposal to install groundwater pumping wells up-gradient from the Travertine Spring Complex where the Nevares Spring naucorid bug occurs (National Park Service 2008, p. 40). The new water diversion system replaced an existing collection gallery. The volume of water removed using the new water diversion system would be the same as current withdrawals. This new system also includes a non-potable collection gallery installed downstream from the Complex. This will be used to water the golf course and for the flow-

through swimming pools. The exact effects of implementing this recently installed water diversion method to the spring system, as well as to the Nevares Spring naucorid bug are not known, but the diversion of water from above the springs may change how the water is discharged at the surface; we do not know the effects of such changes. The National Park Service estimates that the pumping activity associated with the system could result in a 24-percent reduction in spring flows in Travertine and Texas Springs area. If the plan results in a reduction in discharge, this would likely adversely affect the Nevares Spring naucorid bug and its habitat. The Park has begun conducting pump test, and is presently in the process of analyzing the data. Because the National Park Service is not certain of the effects, monitoring the output of water at the spring before, during, and after construction, has taking place. Prior to construction, Sada and Herbst expanded on their 2006 study by systematically researching the effects of various water discharge levels on benthic macroinvertebrate community composition in one of the springs. Monitoring to identify thresholds of discharge that are necessary to sustain the current community composition as well as provide valuable information towards spring restoration objectives is being conducted. Return of surface flows to the current dry channel located south of Travertine Springs Line 2 collection gallery provides the opportunity to restore historical wetland and riparian habitat and has the potential to expand available habitat for the Nevares Spring naucorid bug. The consequences from this new water system are still to be determined, and results should be available by the next assessment update in 2011.

Ground water is Death Valley National Park's principal source of water for desert springs, seeps, and streams. The maintenance of the quality and quantity of ground water is critical to the survival of desert surface waters, including springs, and the habitat for the Nevares Spring naucorid bug.

The water flowing from the Travertine and Texas Springs area is supplied by an underground aquifer that stretches into southwestern Nevada (National Park Service 2002, p. 21). Recently, the State of Nevada has received an increasing number of permit applications to pump ground water from this aquifer. As the human population in southwestern Nevada grows, the demand for ground water and the application for permits to pump more ground water from this aquifer will grow. This additional pumping will potentially reduce the quantity and velocity of water in desert seeps, springs, and streams and reduce the habitat availability to the Nevares Spring naucorid bug.

Non-native date palms (*Phoenix dactylifera*) and fan palms (*Washingtonia filifera*) are present in the spring habitats that are occupied by the Nevares Spring naucorid bug. The effects of these plants on aquatic communities have not been documented, but anecdotal observations suggest these plant species transpire water that would otherwise be available to maintain water flow within a stream channel. These plants also reduce the primary productivity within an aquatic environment by shading stream channels; this effect in turn is likely to reduce the number of prey items available to the naucorid because overgrown stream habitats are likely to have fewer invertebrates. The presence of palm trees also tends to reduce the overall number of aquatic invertebrates in a stream channel because palm roots and fallen fronds reduce water velocities that maintain riffle habitats required by naucorids. Park staff has been injecting palm trees with herbicide in an effort to slow the colonization of

local stream channels by palm trees, but palms continue to be present in several of the stream channels in the Travertine - Nevares Springs Complex.

According to recent predictions, climate change in this region may result in decreased precipitation, increased temperatures, and a decrease in recharge to the groundwater system (Fisk 2010). If this occurs, the assumption is that the local aquatic ecosystem will be adversely affected, and the Nevares Spring naucorid bug's habitat will decrease even further. The amount of discharge into the springs, water velocity, and shading characteristics may be altered.

B. Overutilization for commercial, recreational, scientific, or educational purposes: This factor is not known to currently affect the Nevares Spring naucorid bug.

C. Disease or predation: Naucorids are predatory animals; they consume a number of prey species that include small aquatic insects and crustaceans. Nevares Spring naucorid bugs that occur in Furnace Creek Wash along the southern boundary of the Travertine Springs area co-occur with non-native mosquitofish (*Gambusia affinis*). The presence of mosquitofish in Furnace Creek Wash is likely to adversely affect the Nevares Spring naucorid bug by direct predation of young and adult naucorids and competition for food resources. The mosquitofish is a generalist predator (Bence 1988, p. 505; Linden and Ceck 1990, p. 115; Rupp 1996, p. 160). Field experiments that evaluated survival rates of low density mosquito larvae populations when mosquitofish were present suggest that none of the mosquito larvae persisted after a 5-hour trial period (Goodsell and Kats 1999, p. 923). Other studies have demonstrated that mosquitofish eliminate *Daphnia* and other invertebrate populations (Hurlbert et al.1972, p. 639). Additional field experiments have revealed that mosquitofish significantly reduce the abundance of predatory aquatic insect species that include notonectids, belostomatids, and odonates (Lawler et al.1999, p. 618). These animals are typically as large as or larger than individuals of the Nevares Spring naucorid bug. Consequently, if mosquitofish are able to prey on a large variety of aquatic invertebrates, including larger predatory insects, they are likely to eat smaller prey items such as Nevares Spring naucorid bugs. An overlap in the diet of mosquitofish and Nevares Spring naucorid bugs is also likely to exist because both species prey on aquatic invertebrate species. Collectively, these studies suggest that mosquitofish are likely to prey on Nevares Spring naucorid bugs and to compete with these insects for limited food resources.

An introduced crayfish (*Procambarus* sp.) is known to be present in aquatic habitats on the Ranch; these habitats are within 2 miles of streams that are occupied by the Nevares Spring naucorid bug. Studies have indicated that introduced crayfish alter vegetation communities in aquatic environments (Lodge and Lorman 1987, p. 595; Chambers et al.1990, p. 88; Creed 1994, p. 2098; Lodge et al.1994, p. 1276) and adversely affect aquatic invertebrate species through direct predation (Chambers et al.1990, p. 90; Hanson et al.1990, p. 77). Because flash flood events, although infrequent, occur in the Travertine Springs area, the potential exists for crayfish to colonize stream habitats where Nevares Spring naucorid bugs are present. At least one published account indicates that crayfish have the potential to quickly and effectively disperse into previously unoccupied habitats (Momot 1966, p. 158). In the event that crayfish disperse from the Ranch to the Travertine Springs area, they would likely

reduce the limited number of the Nevares Spring naucorid bug that inhabit the spring complex.

D. The inadequacy of existing regulatory mechanisms: The Nevares Spring naucorid bug does not benefit from existing regulatory mechanisms from the State of California or the Federal government specifically addressing the naucorid bug or its habitat.

The species is not currently classified as a threatened, endangered, rare, or species of special concern by the State of California. The State of California is unlikely to list an invertebrate as threatened or endangered; California has listed only three invertebrate species as threatened or endangered, while 77 vertebrate taxa have been listed. The State of California has no regulations that specifically protect invertebrates from habitat loss. If the State of California did classify the Nevares Spring naucorid bug as a listed species, it is unlikely that the National Park Service would recognize State jurisdiction over the species because the Federal government claims jurisdiction over the Federal resources it manages.

The Nevares Spring naucorid bug was classified as a candidate Category 2 species in the November 1994 Animal Candidate Notice of Review. The status of the species at that time was considered to be declining. The candidate Category 2 status was discontinued in February 28, 1996 (61 FR 7596), and only Category 1 species became recognized as candidates for listing purposes. Plants and animals that were classified previously as candidate Category 2 species were considered to be those that might require special management consideration to prevent future listing as threatened or endangered. The species does not currently appear on any advisory watch list that is maintained by the State or Federal government.

The Nevares Spring naucorid bug does not have a geographic distribution that overlaps the range of another taxon that is listed as threatened or endangered. Therefore, no regulatory requirements exist to prevent adverse effects to the species' aquatic habitat because it does not co-occur with a listed species.

The National Park Service Organic Act of 1916 (39 Stat. 535, 16 U.S.C. 1, as amended), states that the National Park Service "shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations … to conserve the scenery and the national and historic objects and the wildlife therein . . ." The National Park Service Organic Act as well as National Park Service natural resources management guidelines should provide some level of protection for the naucorid bug population even in the absence of listing under the ESA; however, no current management plans or similar documents specifically mention the need to protect the Nevares Spring naucorid bug or its habitat.

E. Other natural or manmade factors affecting its continued existence: There are no identified threats under this factor known to currently affect the Nevares Spring naucorid bug.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED: A conservation agreement has not been initiated; the National Park Service has not committed funds or provided documentation that would initiate the development of a conservation agreement.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate): The various spring habitats that are occupied by the Nevares Spring naucorid bug have experienced a variety of adverse effects that have collectively reduced the geographic range of the species and degraded the limited number of aquatic habitats where the species continues to persist. The activities that have adversely affected the status of the Nevares Spring naucorid bug include past and ongoing water diversion activities, the alteration and degradation of naucorid habitat from the ongoing presence of non-native plant species, past and ongoing predation/competition from non-native fish species, potential future predation by non-native crayfish, and a current lack of regulatory mechanisms that could be afforded by the State of California or the Federal government. The distribution of the naucorid is limited to 12 small springbrooks, and the density of naucorids in the streams where it does occur is low. The species has specific habitat affinities that make it susceptible to water diversion, and the flightless nature of the species makes it difficult to disperse to, or colonize, new aquatic habitats. The National Park Service and State of Nevada have begun pumping activities that have the potential to affect the quality of the aquatic habitat and the velocity of the water where the naucorid occurs. The endemism of the Nevares Spring naucorid bug, the low number of habitats that it occupies, and the diversity of factors that adversely affect the species demonstrate that the magnitude of the threats facing the species is high. The threats facing the naucorid are not likely to result in the extinction of the species within the immediate future; however, they are likely to reduce the extent of an already limited habitat area. Because the Nevares Spring naucorid bug is a taxonomically recognized species, we assign a listing priority number of 5 for this taxon. We find that Nevares Spring naucorid bug is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

RECOMMENDED CONSERVATION MEASURES: Whiteman and Sites (2008, p. 503) have recognized that the Nevares Spring naucorid bug is the closest species (invertebrate or vertebrate), occurring in the Nevares-Travertine Spring Complex, to being protected by the Endangered Species Act. Through their research and observations of the species and its habitat, they have come up with several methods for conserving the Nevares Spring naucorid bug and therefore, the Furnace Creek ecosystem. Installing groundwater wells, for the new water collection system, could potentially restore riparian habitat or provide higher quality habitat for the species. The Park should continue to monitor discharge differences at the streams within the Complex as the water wells and pumps are operational. Non-native fish, including crayfish, should be closely monitored and removed if found where naucorid bugs are known to exist. If crayfish were introduced into naucorid bug habitat, the predator could eliminate the species rapidly. Continued removal of non-native plants from the banks of outflows and from the channel, and planting of native plants along patches of outflows should take place. This allows for the correct amount of sunlight to reach the water and for a maximum diversity of habitat. If gravel is introduced or deposited into the streams or channel, extreme care should be taken to ensure the particle size is identical to the gravel that exists. Altering particle sizes within the streams will affect water velocity and depth; therefore, presence and abundance of the Nevares Spring naucorid bug and other endemic species are affected.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	**5***
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: The magnitude of threats pertaining to the Nevares Spring naucorid bug is high, given the number of activities that have the potential to further reduce the insect's abundance or degrade habitat quality and quantity in many or most of the remnant wetlands where the species persists. For example, if crayfish were to invade the aquatic habitats where the Nevares Spring naucorid bug occurred, the abundance of the bug would be seriously reduced below the already low levels. Because the National Park Service does not routinely conduct surveys for crayfish or other exotic aquatic species, the invasion of crayfish into naucorid-occupied habitat would not be detected until well after the aquatic invertebrate community had been drastically affected.

Imminence: The Nevares Spring naucorid bug is not in imminent danger of extinction in the immediate future. Human activities that could adversely affect the species or its habitat, including construction of the Furnace Creek Water Collection System, could potentially affect the bug during its operation with further reductions in available habitat from reduced flows and water velocities. However, these activities are not expected to result in the extinction of the species in the immediate future.

Rationale for Change in Listing Priority Number (insert if appropriate)

___ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? Yes.

Is Emergency Listing Warranted?: Emergency listing is not warranted at this time because activities that are likely to extirpate all of the Nevares Spring naucorid bugs in the Travertine-Nevares Spring Complex in the next 12 months have not been identified. Rather activities have been identified that are likely to substantially reduce the Navares Spring naucorid bug and its habitat in the next 12 months.

DESCRIPTION OF MONITORING: Prior to construction, Sada and Herbst expanded on their 2006 study by systematically researching the effects of various water discharge levels on benthic macroinvertebrate community composition in one of the springs. They worked to identify thresholds of discharge that are necessary to sustain the current community composition as well as provide valuable information towards spring restoration objectives. Sada is currently analyzing data after monitoring the response of a single stream within the Complex, and the associated invertebrates, as the pumping system operates. Specific monitoring of population levels of the Nevares Spring naucorid bug throughout its range is not occurring, although researchers are developing a groundwater flow model for portions of the Amargosa Desert and Travertine Springs area to evaluate affects on the groundwater flow system resulting from climate change (Fisk 2010, p. 1). This study should provide insight into how aquatic and riparian communities will respond to climate change. Staff from the Ventura Fish and Wildlife Office periodically attempt to determine if any new literature has been published for the species and will occasionally call Park staff to determine if any proposed projects may affect the status of the species.

COORDINATION WITH STATES: Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: No state within the range of the species provided information or comments on the species or latest species assessment.

Indicate which State(s) did not provide any information or comments: The State of California did not provide any information or comments on the species or latest species assessment.

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 6.7.2010
Regional Director, Fish and Wildlife Service Date

Concur: _____ Date: October 22, 2010
ACTING
Director, Fish and Wildlife Service

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April 2010
Conducted by: Danielle Dillard

FY 2010, R8 CNOR: Nevares Spring naucorid bug